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A look at the status of computer assisted language learning and its applications

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Abstract

The boom of technology, industrial revolution, replacement of man force by robots, digital age, all and all are terms that tell us, experts in the field of language learning, one thing: changes are bound to happen and inevitable. The only thing to be done then is to know the circumstances well and try to keep a balance between the old and new teaching traditions to remain successful in our professions. In the world where we live, no phenomenon can be regarded as pure folly or wisdom, advantage or disadvantage. We gain one thing at the cost of loosing another. The advent of new technologies and their implementation to the field of education is no exception. Different aspects of these technologies need to be examined to figure out which of them fall within our advantage and in what circumstance.

In this article attempts have been made to make a comprehensive critical review of different viewpoints asserted by scholars in the field to find the common grounds and points of similarity. The result yields a good guideline for those who are to make a judgment or decision on what's most congruent for their students and the teaching strategy they adopt.

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1. Introduction

1.1. The history of CALL

Levy (1997, p. 1) elaborates Computer-assisted language learning (CALL) as "the search for and study of applications of the computer in language teaching and learning". CALL includes most of what we recognize as Information and communication technology (ICT) applications s well as approaches to teaching and learning foreign languages. The "traditional" drill-and-practice programs that characterized CALL in the 1960s and 1970s to more recent manifestations of CALL, e.g. as used in a virtual learning environment and Web-based distance learning. It also extends to the use of concordances, interactive whiteboards, (Schmid, 2009), Computer-mediated

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communication (CMC) (Lamy, 2007), language learning in virtual worlds and Mobile-assisted language learning (MALL) (Shield, 2008).

An alternative term, Technology-enhanced language learning (TELL) (Bush, 1997) also emerged around the early 1990s: e.g. the TELL Consortium project, University of Hull.

The design of CALL materials generally takes into consideration principles of language pedagogy and methodology, which may be derived from different learning theories (e.g. behaviourist, cognitive, constructivist) and second language learning theories such as Stephen Krashen's monitor hypothesis.

2. Different types of CALL applications

2.1 Typology and phases

Within the 1980s and 1990s they attempted to come up with a CALL typology. To achieve this purpose a variety of CALL programs was designated by Davies and Higgins (1985), Jones and Fortescue (1987), Hardisty and Windeatt (1989), and Levy (1997). Among these one can enumerate, multiple-choice programs, free-format (text-entry) programs, adventures and simulations, action mazes, sentence-reordering programs, gap-filling and Cloze programs exploratory programs - and "total Cloze", a type of program in which the learner is required to rewrite a whole text. In modern versions most of these programs still could be found.

2.2. Flashcards

One of the main usages of CALL is in acquiring vocabulary through flashcards, which entails existence of very trivial programs. Such programs often get advantage of spaced repetition, something which presents the learner with the vocabulary items that need to be saved in memory in an uncontinuous way with the aim of achieving long-term retention, the outcome has been development of a number of applications known as spaced repetition systems (SRS), including the generic SuperMemo package and programs such as BYKI and phase-6, designed for the sole purpose of language education.

2.3. Multimedia

Technology has been used by language instructors for a long time. They started by using gramophones, then it was tape recorders, video players and CDs. Some other samples of technological tools used in educational settings are: data projectors, internet, laptops, language simulator software, DVDs, weblogs, etc. Then multimedia courses came to existence. Teachers frequently use online dictionaries, forums, dictionary software and encyclopedia.

2.4. Internet

Internet is quite a useful tool for language teachers. Chat rooms, weblogs, websites, online dictionaries, forums like yahoo answers, etc. The most important thing for teachers is to devise a suitable lesson plan so that they can prevent waste of time and undesirable activities on the net. They should be able to teach students how to find the best place for that suits their educational needs best and find the most reliable sources on the net. They should also be aware of the fact that the flow of information available on the net might act as an impediment to development in itself as long as we look for teaching specific issues to students not everything.

2.5. Human language technologies

Human Language Technologies (HLT) include a number of areas of research and development that focus on the use of technology to make communication easy in a multilingual information society.

Something that is of greatest interest to the language instructor is Natural Language Processing (NLP), especially the areas of speech synthesis, speech recognition and parsing.

Speech synthesis has made immerse improvement in recent years. It is often used in electronic dictionaries to enable learners to find out how words are pronounced. At word level, speech synthesis is quite effective, the artificial voice often closely resembling a human voice. At phrase level and sentence level, however, there are often problems of intonation, resulting in speech production that sounds unnatural even though it may be intelligible. Speech synthesis as embodied in Text To Speech (TTS) applications is invaluable as a tool for unsighted or partially sighted people. Gupta and Schulze (2010: Section 4.1) list several examples of speech synthesis applications.

Speech recognition is less advanced than speech synthesis. It has been used in a number of CALL programs, in which it is usually described as Automatic Speech Recognition (ASR). ASR is not easy to implement. Ehsani and Knodt (1998) summarize the core problem as follows:

> Complex cognitive processes account for the human ability to associate acoustic signals with meanings and intentions. For a computer, on the other hand, speech is essentially a series of digital values. However, despite these differences, the core problem of speech recognition is the same for both humans and machines: namely, of finding the best match between a given speech sound and its corresponding word string. Automatic speech recognition technology attempts to simulate and optimize this process computationally.

Programs embodying ASR normally provide a native speaker model that the learner is requested to imitate, but the matching process is not 100% reliable and may result in a learner's perfectly intelligible attempt to pronounce a word or phrase being rejected (Davies, 2010). Parsing is used in a number of ways in CALL. Gupta and Schulze (2010) describe how parsing may be used to analyze sentences, presenting the learner with a tree diagram that labels the constituent parts of speech of a sentence and shows the learner how the sentence is structured.

Parsing is also used in CALL programs to analyze the learner's input and diagnose errors. Davies (2002) writes:

> Discrete error analysis and feedback were a common feature of traditional CALL, and the more sophisticated programs would attempt to analyze the learner's response, pinpoint errors, and branch to help and remedial activities. Error analysis in CALL is, however, a matter of controversy. Practitioners who come into CALL via the disciplines of computational linguistics, e.g. Natural Language Processing (NLP) and Human Language Technologies (HLT), tend to be more optimistic about the potential of error analysis by computer than those who come into CALL via language teaching. [...] An alternative approach is the use of Artificial Intelligence (AI) techniques to parse the learner's response - so-called *intelligent CALL* (ICALL) - but there is a gulf between those who favor the use of AI to develop CALL programs (Matthews 1994) and, at the other extreme, those who perceive this approach as a threat to humanity. (Last, 1989, p. 153)

Underwood (1989) and Heift and Schulze (2007) present a more positive picture of AI.

Research into speech synthesis, speech recognition and parsing and how these areas of NLP can be used in CALL are the main focus of the NLP Special Interest Group within the professional association and the ICALL Special Interest Group within the professional association. The EUROCALL NLP SIG also maintains a Ning (Wikipedia).

3. Conclusion

The advent of computer technology has affected the education industry. Yet there are points of weakness and strength. The positive part is the flexibility of the technology to adapt itself with the educational needs of students and cover the for language skills that is, listening, speaking, reading and writing. The ability it endows to students

to have “a world of information at their fingertips is another advantage of computers. Students can use internet technology and software to find out the response to virtually any question in no time at all. The possible shortfalls are: students might be accustomed to old learning techniques depending on their age. Older students are less likely to fell at home when it comes to using new technologies. The younger students have a different problem; they might not have the necessary skills to use the technology. Another thing that matters here is the economy of the program that is to be conducted using the technology. Some technologies are costly and many institutes cannot afford using them. The teaching staff must be skilled enough to help students use the technology as well.

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